

=> d his ful

(FILE 'HOME' ENTERED AT 12:42:42 ON 06 OCT 2008)

FILE 'HCAPLUS' ENTERED AT 12:44:46 ON 06 OCT 2008

L1 1 SEA ABB=ON PLU=ON US2006-577547/AP, PRN OR US20067014806
6/PN OR WO2003-00204/AP, PRN
D L1 ALL
E HORTA/AU
E HORTA R/AU
E HORTA RON/AU
L2 4 SEA ABB=ON PLU=ON "HORTA RONALDO DE MOREIRA"/AU
E DE FREITAS/AU
E DE FREITAS L/AU
E DE FREITAS LINO/AU
E DE FREITAS ROD/AU
E DEFREITAS L/AU
E DEFREITAS/AU
E DEFREITAS R/AU
E DE FREITAS/AU
L3 6 SEA ABB=ON PLU=ON "DE FREITAS L R"/AU
E TUDE/AU
E TUDE JAO/AU
E TUDE JAO/AU
L4 6 SEA ABB=ON PLU=ON "TUDE JOAO ALBERTO LESSA"/AU
E COMPANHIA/CO
E COMPANHIA VALE/CO
L5 120 SEA ABB=ON PLU=ON ("COMPANHIA VALE DO RIO DOCE"/CO OR
"COMPANHIA VALE DO RIO DOCE CVRD"/CO OR "COMPANHIA VALE
DO RIO DOCE CVRD TECHNOLOGY CENTER"/CO OR "COMPANHIA
VALE DO RIO DOCE MINERAL DEVELOPMENT CENTER"/CO OR
"COMPANHIA VALE DO RIO DOCE MINERAL DEVELOPMENT CENTRE"/C
O OR "COMPANHIA VALE DO RIO DOCE PELLETIZING SUPERINTENDE
NCY"/CO OR "COMPANHIA VALE DO RIO DOCE RESEARCH CENTER"/C
O OR "COMPANHIA VALE DO RIO DOCE SA"/CO)
L6 129 SEA ABB=ON PLU=ON COMPANHIA VALE DO RIO DOCE/CS, PA
L7 139 SEA ABB=ON PLU=ON (L2 OR L3 OR L4 OR L5 OR L6)

L8 1011308 SEA ABB=ON PLU=ON (MAGNETIS? OR MAGNETIZ? OR MAGNETIC?)
L9 1628041 SEA ABB=ON PLU=ON (REDUCTION? OR REDUCING? OR REDOX#)
L10 3634 SEA ABB=ON PLU=ON L8 (2A) L9
L11 122098 SEA ABB=ON PLU=ON CALCIN?

FILE 'REGISTRY' ENTERED AT 13:59:52 ON 06 OCT 2008

E TITANIUM/CN
L12 1 SEA ABB=ON PLU=ON TITANIUM/CN
E ANATASE/CN
L13 1 SEA ABB=ON PLU=ON ANATASE/CN

FILE 'HCAPLUS' ENTERED AT 14:00:18 ON 06 OCT 2008

L14 575979 SEA ABB=ON PLU=ON L12 OR L13 OR TITANIUM? OR ANATASE?
L15 267916 SEA ABB=ON PLU=ON ORE#
L16 3408 SEA ABB=ON PLU=ON L14 (3A) L15
D L16 1-10 KWIC
L17 29332 SEA ABB=ON PLU=ON ?KILN?
L18 282987 SEA ABB=ON PLU=ON ?FURNACE?
L19 15396 SEA ABB=ON PLU=ON FLUID? (2A) ?REACTOR?
L20 115 SEA ABB=ON PLU=ON L11 AND L16
D L20 1-1 KWIC
D L20 2-10 KWIC
L21 2 SEA ABB=ON PLU=ON L20 AND L10
D L21 1-2 KWIC
L22 48951 SEA ABB=ON PLU=ON L9 (3A) (GAS# OR GASES# OR ATMOSPHER?
)
L23 122 SEA ABB=ON PLU=ON L22 AND L10
D L23 1-10 KWIC
L24 54 SEA ABB=ON PLU=ON L22 AND L16
D L24 1-10 KWIC
L25 18 SEA ABB=ON PLU=ON L24 AND ((L17 OR L18 OR L19))
D L25 1-10 KWIC
L26 26093 SEA ABB=ON PLU=ON (REMOV? OR EXTRACT? OR EXT# OR
SEPARAT? OR ISOLAT? OR PURIF? OR RECOVER?) (2A) (L8)
L27 228 SEA ABB=ON PLU=ON L26 AND L16
D L27 1-10 KWIC
L28 79776 SEA ABB=ON PLU=ON RADIONUCLID? OR RADIOISOTOP? OR
RADIO? (W) (NUCLIDE# OR ISOTOPE#)
L29 1 SEA ABB=ON PLU=ON L27 AND L28
D L29 TI AU

FILE 'REGISTRY' ENTERED AT 14:17:51 ON 06 OCT 2008
E HYDROCHLORIC ACID/CN
L30 1 SEA ABB=ON PLU=ON "HYDROCHLORIC ACID"/CN

FILE 'HCAPLUS' ENTERED AT 14:18:07 ON 06 OCT 2008

L31 668906 SEA ABB=ON PLU=ON (L30 OR HYDROCHLORIC? OR HYDRO(W) CHLO
RIC? OR HCL#)
L32 17 SEA ABB=ON PLU=ON L27 AND L31
D L32 1-10 KWIC
L33 17 SEA ABB=ON PLU=ON L25 NOT L21
L34 16 SEA ABB=ON PLU=ON L33 NOT L32
L35 34 SEA ABB=ON PLU=ON L34 OR L32 OR L21

L36 6 SEA ABB=ON PLU=ON L35 AND PY<=2003 NOT P/DT
L37 24 SEA ABB=ON PLU=ON L35 AND (PD<=20031028 OR PRD<=2003102
 8 OR AD<=20031028) AND P/DT
L38 30 SEA ABB=ON PLU=ON L36 OR L37
 D L38 4-12 KWIC
L39 413 SEA ABB=ON PLU=ON (LOW# OR LESS# OR LESSEN? OR
 REDUCED# OR DIMINISHED#) (2W) (L28)
L40 2 SEA ABB=ON PLU=ON L39 AND L16
L41 29 SEA ABB=ON PLU=ON L38 NOT L40
 D L40 1-2 KWIC

FILE 'REGISTRY' ENTERED AT 14:33:44 ON 06 OCT 2008
E SODIUM FLUORIDE/CN
L42 1 SEA ABB=ON PLU=ON "SODIUM FLUORIDE"/CN
E AMORPHOUS SILICA/CN
L43 2 SEA ABB=ON PLU=ON "AMORPHOUS SILICA"/CN

FILE 'HCAPLUS' ENTERED AT 14:34:23 ON 06 OCT 2008
L44 46356 SEA ABB=ON PLU=ON L42 OR SODIUM# (W) FLUORIDE# OR NAF#

L45 463303 SEA ABB=ON PLU=ON L43 OR AMORPH? (2A) (SILICA? OR
 SIO2# OR SILICON# (W) ?OXIDE?)
L46 22 SEA ABB=ON PLU=ON L16 AND L44
L47 3 SEA ABB=ON PLU=ON L46 AND L45
L48 29 SEA ABB=ON PLU=ON L41 NOT L47
L49 32 SEA ABB=ON PLU=ON L41 OR L47
 D L47 1-3 KWIC
L50 29 SEA ABB=ON PLU=ON L49 NOT L7

FILE HOME

FILE HCAPLUS

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FILE COVERS 1907 - 6 Oct 2008 VOL 149 ISS 15
FILE LAST UPDATED: 5 Oct 2008 (20081005/ED)

HCAplus now includes complete International Patent Classification (I reclassification data for the second quarter of 2008.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE STNGUIDE

FILE CONTAINS CURRENT INFORMATION.

LAST RELOADED: Oct 3, 2008 (20081003/UP).

FILE REGISTRY

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 5 OCT 2008 HIGHEST RN 1057399-47-9

DICTIONARY FILE UPDATES: 5 OCT 2008 HIGHEST RN 1057399-47-9

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH July 5, 2008.

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<http://www.cas.org/support/stngen/stndoc/properties.html>

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YOU HAVE REQUESTED DATA FROM FILE 'HCAPLUS' - CONTINUE? (Y)/N:y

L50 ANSWER 1 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 2003:301262 HCAPLUS Full-text
DN 138:306191
TI Acidic leaching and froth flotation of Ti ores for manufacture of titania powders
IN Gomez, Rudy
PA RMG Services Pty. Ltd., Australia
SO PCT Int. Appl., 26 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	WO 2003031664	A1	20030417	WO 2002-AU1360	200210 08	
					<--	
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW					
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG					
	AU 2002333048	A1	20030422	AU 2002-333048	200210 08	
					<--	
	AU 2002333048	B2	20080821			
	US 20050025687	A1	20050203	US 2004-492057	200404 08	
					<--	
	ZA 2004003568	A	20041202	ZA 2004-3568	200405 11	
					<--	
PRAI	AU 2001-8203	A	20011012	<--		
	WO 2002-AU1360	W	20021008	<--		
AB	The Ti-ore feed of rutile and ilmenite type is processed by acidic leaching, and the leached residue is treated by flotation to recover high-grade TiO ₂ powder of ≥99% purity. The Ti-ore feed is typically leached with aqueous H ₂ SO ₄ , HCl, or HNO ₃ solution containing added oxidant (especially H ₂ O ₂), using conventional or microwave heating. The TiO ₂ concentrate is optionally dissolved in hot acidic leaching at >110°, and the resulting aqueous solution is cooled to -10° to precipitate nanosize TiO ₂ . The residual solids from leaching are purified by froth flotation to obtain high-quality TiO ₂ powder. The flotation tailings can be processed by high-intensity magnetic					

separation to recover chromite, and by gravity separation to recover ZrO₂, Au, and Pt from the SiO₂ residue.

IC ICM C22B034-12
ICS C01G023-053
CC 49-3 (Industrial Inorganic Chemicals)
ST titanium ore acidic leaching titania powder; acidic leaching titania ore froth flotation
IT Magnetic separation
(Ti-ore, after leaching; acidic leaching and froth flotation of Ti ores for manufacture of purified titania powders)
IT 7647-01-0, Hydrochloric acid, processes
7664-93-9, Sulfuric acid, processes 7697-37-2, Nitric acid, processes
7722-84-1, Hydrogen peroxide, processes 12125-02-9, Ammonium chloride, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(aqueous leach solution containing, for Ti ores; acidic leaching and froth flotation of Ti ores for manufacture of purified titania powders)

RETABLE

Referenced Author Referenced	Year	VOL	PG	Referenced Work (RWK)		File
(RAU)	(RPY)	(RVL)	(RPG)		====	====
==						
Kaolin Industries Ltd	1991		CA 1292856 A		HCAPLUS	
Tekhenergokhimprom	1982		SU 924138 A			
Tolley	1979		US 4158041 A		HCAPLUS	
Young	1985		US 4501658 A			
Zhang, J	2001		CN 1287099 A		HCAPLUS	

L50 ANSWER 2 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 2000:98847 HCAPLUS Full-text

DN 132:139390

TI Titania recovery from ore smelting titania slag by oxidation and reduction treatment

IN Van Dyk, Jacobus Philippus; Vegter, Nanne Mattheus; Visser, Cornelia Petronella; De Lange, Thomas; Winter, John David; Walpone, Ernest Alan; Nell, Johannes

PA Ipcor N.V., Neth. Antilles

SO PCT Int. Appl., 43 pp.
CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

PATENT NO.

KIND

DATE

APPLICATION NO.

DATE

PI	WO 2000006786	A1	20000210	WO 1999-IB1326	199907 27	
				<--		
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW					
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG					
	ZA 9904723	A	20000131	ZA 1999-4723	199907 22	
				<--		
	CA 2338716	A1	20000210	CA 1999-2338716	199907 27	
				<--		
	AU 9947928	A	20000221	AU 1999-47928	199907 27	
				<--		
	AU 749393	B2	20020627		199907 27	
	DE 19983400	T0	20010913	DE 1999-19983400		
				<--		
	AP 1297	A	20040906	AP 2000-2021	199907 27	
				<--		
	NO 2001000424	A	20010326	NO 2001-424	200101 24	
				<--		
	US 6803024	B1	20041012	US 2001-744531	200106 15	
				<--		
PRAI	ZA 1998-6758	A	19980729	<--		
	WO 1999-IB1326	W	19990727	<--		
AB	Titania slag, especially from smelting of ilmenite, is treated for increased impurity leachability by crushing the slag to a particle size of 75-850 µm; oxidizing the slag particles at 700-950°C in air					

[allowing the iron present in the slag to concentrate at the exposed surfaces of the particles and/or allowing an anatase phase to stabilize in the slag, and allowing a major portion of the Fe(II) to convert to the Fe(III) and the Ti(III) to Ti(IV)]; and reducing the oxidized slag in a reducing atmospheric (in CO) at 700–950°C to convert a major portion of the Fe(III) to Fe(II) without converting the Ti(IV) to Ti(III). The treated slag may be subjected to acid (HCl) or base leaching of metal impurities.

- IC ICM C22B034-12
 ICS C01G023-047
- CC 49-3 (Industrial Inorganic Chemicals)
 Section cross-reference(s): 54
- IT Calcination
 Magnetic separation
 Oxidation
 Reduction
 (titania recovery from ore-smelting slags by oxidation and reduction)
- IT 7647-01-0, Hydrogen chloride, processes
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (titania recovery from ore-smelting slags by oxidation and reduction)
- IT 1317-70-0P, Anatase 13463-67-7P, Titania, preparation
 RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PREP (Preparation); PROC (Process)
 (titania recovery from ore-smelting slags by oxidation and reduction)

RETABLE

Referenced Author Referenced (RAU)	Year VOL PG Referenced Work (RPY) (RVL) (RPG) (RWK) File					
=====+=====+=====+=====+=====+=====+=====						
British Titan Limited	1972 GB 1282506 A	HCAPLUS				
de Mendonca, P	1979 US 4176159 A	HCAPLUS				
Michel, G	1995 US 5389355 A	HCAPLUS				
Qit Fer Titane Inc	1997 WO 9719199 A	HCAPLUS				
Stickney, W	1973 US 3739061 A	HCAPLUS				
Tiomin Resources Inc	1998 GB 2315742 A	HCAPLUS				

L50 ANSWER 3 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1994:82270 HCAPLUS Full-text

DN 120:82270

OREF 120:14697a,14700a

TI Redox kiln method for beneficiation of titanium-containing ores with removal of iron

IN Reeves, James William; Zander, Bo Harry; Ericson, Aake Sandor
PA du Pont de Nemours, E. I., and Co., USA

SO PCT Int. Appl., 26 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9323580	A1	19931125	WO 1993-US4393	199305 14
				<--	
	W: AU, BR, CA, FI, NO, NZ				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	AU 9342415	A	19931213	AU 1993-42415	199305 14
				<--	
	AU 677199	B2	19970417		
	EP 641396	A1	19950308	EP 1993-911193	199305 14
				<--	
	EP 641396	B1	19960424		
	R: DE, ES, FR, GB, SE				
	ES 2087739	T3	19960716	ES 1993-911193	199305 14
				<--	
	BR 9306544	A	19980915	BR 1993-6544	199305 14
				<--	
	FI 9405443	A	19941118	FI 1994-5443	199411 18
				<--	
	FI 103733	B	19990831		
	FI 103733	B1	19990831		
	NO 9404428	A	19941118	NO 1994-4428	199411 18
				<--	
	US 5660805	A	19970826	US 1996-592499	

<--

PRAI US 1992-886310 A 19920521 <--
US 1989-430892 B1 19891031 <--
US 1991-650498 B2 19910205 <--
WO 1993-US4393 A 19930514 <--
US 1994-232316 B1 19940425 <--
US 1995-376474 B1 19950120 <--

AB Powdered Ti-ore feed containing Fe oxides is processed in a kiln as a mixture with a carbonaceous reducing material and HCl (or its precursor) at 900-1100°, with the average ore powder size <40 µm. The kiln treatment promotes reduction of the Fe oxides to Fe metal powder with the average size >50 µm, followed by unloading the kiln and separating the Fe from TiO₂-rich ore products. The process is suitable for ilmenite ores, using a lignite char and controlling the HCl vapor pressure at 0.05-0.9 atmospheric

IC ICM C22B034-12

CC 54-2 (Extractive Metallurgy)

ST titanium iron oxide ore redn kiln;
carbon redn titanium iron ore kiln

IT Titanium ores

RL: PROC (Process)

(beneficiation of, reduction stage in kiln with carbon in,
before separation of iron)

IT Coal, brown

RL: PROC (Process)

(reduction with, of titanium-iron ores, iron
separation after)

IT Kilns

(rotary, reduction in, of titanium ores, iron
separation after partial)

IT 12168-52-4, Ilmenite

RL: PROC (Process)

(ores containing, reduction in kiln of, for separation of iron
from
oxide residue)

IT 13463-67-7P, Titanium dioxide, preparation

RL: PUR (Purification or recovery); PREP (Preparation)
(recovery of, from titanium-iron ores, reduction
in kiln with carbon in)

IT 7440-44-0, Carbon, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction with, of titanium-iron ores in
kiln, separation of iron from oxide residue after)

IT 7439-89-6, Iron, miscellaneous

RL: REM (Removal or disposal); PROC (Process)

(removal of, from titanium-iron ores, reduction
in kiln with carbon before separation for)

IT 7647-01-0, Hydrochloric acid, reactions 7705-08-0, Ferric
chloride, reactions 7758-94-3, Ferrous chloride
RL: RCT (Reactant); RACT (Reactant or reagent)
(vapor, kiln atmospheric with, in reduction of
titanium-iron ores with separation of iron from
oxide residue)

L50 ANSWER 4 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1993:217039 HCAPLUS Full-text

DN 118:217039

OREF 118:37373a,37376a

TI Leaching for removal of radioactive elements from titaniferous ores

IN Houchin, Martin Richard; Aral, Halil; Bruckard, Warren John;
Freeman, David Edward; Harris, Harold Robert

PA AMC Mineral Sands Ltd., Australia

SO Braz. Pedido PI, 22 pp.

CODEN: BPXXDX

DT Patent

LA Portuguese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	BR 9201441	A	19921201	BR 1992-1441	199204 16
	AU 9214980	A	19921022	AU 1992-14980	199204 16
	ZA 9202816	A	19930802	ZA 1992-2816	199204 16
	ZA 9202819	A	19930802	ZA 1992-2819	199204 16
	JP 05180988	A	19930723	JP 1992-99262	199204 20

PRAI AU 1991-5707 A 19910419

AB The process comprises leaching the Ti-containing ores and similar
materials using a fluoride-containing acid, to promote removal of
radioactive Th and U from ilmenites as well as synthetic rutile. The
fluorides are selected from HF, NaF, NH₄F, and Na₂SiF₆, and the acid
is preferably H₂SO₄. This process is also suitable for removal of
Al₂O₃ and SiO₂ impurities. Before the leaching stage, the Ti-

containing feed is optionally pretreated with aqueous alkaline solution. The process may be carried out in SiC-lined crucibles or rotary kilns.

- IC ICM C22B034-12
ICS C22B003-06
- CC 54-2 (Extractive Metallurgy)
Section cross-reference(s): 71
- ST acid leaching radioelement titanium ore; uranium leaching titanium ore; fluoride leaching radioelement ore
- IT Titanium ores
RL: PUR (Purification or recovery); PREP (Preparation)
(purification of, leaching with fluoride-containing acid in, for radioelement removal)
- IT Radioelements, miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from titanium ores, leaching with fluoride-containing acid for)
- IT 409-21-2, Silicon carbide, uses
RL: USES (Uses)
(crucibles, leaching of titanium ores in, with fluoride-containing acid for radioelement removal)
- IT 7664-93-9, Sulfuric acid, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(leaching with fluoride-containing, of titanium ores, radioelement removal by)
- IT 1310-58-3, Potassium hydroxide, uses 1310-73-2, Sodium hydroxide, uses
RL: USES (Uses)
(reagent, titanium ores pretreated with, for radioelement removal by leaching with fluoride-containing acid)
- IT 1344-28-1, Alumina, miscellaneous 7440-29-1D, Thorium, isotopes, miscellaneous 7440-61-1D, Uranium, isotopes, miscellaneous
7631-86-9, Silica, miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from titanium ores, leaching with fluoride-containing acid for)
- IT 16893-85-9, Sodium hexafluorosilicate
RL: PROC (Process)
(sulfuric acid and, leaching of titanium ores with, for radioelement removal)
- IT 7664-39-3, Hydrofluoric acid, reactions 7681-49-4, Sodium fluoride, reactions 12125-01-8, Ammonium fluoride
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfuric acid and, leaching of titanium ores with, for radioelement removal)

L50 ANSWER 5 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1988:60058 HCAPLUS Full-text

DN 108:60058

OREF 108:9967a,9970a

TI Method for purifying titanium oxide ores

IN Chao, Tze

PA du Pont de Nemours, E. I., and Co., USA

SO Eur. Pat. Appl., 15 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 243725	A2	19871104	EP 1987-104943	198704 03
				<--	
	EP 243725	A3	19880224		
	R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE				
	BR 8701481	A	19880119	BR 1987-1481	198704 01
				<--	
	AU 8770976	A	19871008	AU 1987-70976	198704 02
				<--	
	AU 599090	B2	19900712		
	ZA 8702399	A	19881228	ZA 1987-2399	198704 02
				<--	
PRAI	US 1986-847521	A	19860403	<--	
AB	The TiO ₂ -containing ores are roasted at 600-1100° with an alkali metal compound, and leached with a dilute mineral and/or an acidified (except H ₂ SO ₄) aqueous FeCl ₃ to remove metal impurities. The Fe-containing ore feed is preferably roasted in mixts. containing C, followed by magnetic separation. The purified TiO ₂ is suitable for metallurgical use or pigments. Thus, powdered TiO ₂ -rich ore (as anatase concentrate precleaned by magnetic separation) was mixed with Na ₂ CO ₃ at 2.0 g/30 g ore concentrate, and roasted in air for 2 h at .apprx. 800°. The roasted sample was leached for .apprx. 2 h at 90° with 300 mL of aqueous 3% HCl, filtered, washed, and dried. The treated ore contained TiO ₂ 61.8 with Fe ₂ O ₃ 28.5, Al ₂ O ₃ 1.49, P ₂ O ₅				

1.09, and SiO₂ 1.05 as major impurities, compared with 55.4, 24.3, 4.40, 4.77, and 2.09%, resp. in the feed concentrate. Minor impurities in the ore were CaO, BaO, Cr₂O₃, MnO, Nb₂O₅, V₂O₅, ZrO₂, La₂O₃, CeO₂, Nd₂O₃, ThO₂, and U₃O₈.

IC ICM C22B034-12
CC 54-2 (Extractive Metallurgy)
IT Titanium ores
RL: PROC (Process)
(oxide, purification of, roasting and dilute acid leaching in)
IT 7647-01-0, Hydrochloric acid, uses and
miscellaneous
RL: USES (Uses)
(leaching with, of roasted titania-rich ores, purification by)
IT 7439-89-6, Iron, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from titania-rich ores, reduction roasting and
magnetic separation for)

L50 ANSWER 6 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN
AN 1980:429790 HCPLUS Full-text
DN 93:29790
OREF 93:4913a,4916a
TI Furnace for reducing minerals
IN Falcao de Mendonca, Paulo Ayres; Spinola de Castro, Carlos Eugenio
PA Mineracao Vale do Paranaiba S. A., Brazil
SO Braz. Pedido PI, 14 pp.
CODEN: BPXXDX
DT Patent
LA Portuguese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	BR 7800841	A	19790828	BR 1978-841	197802 13

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PRAI BR 1978-841 A 19780213 <--
AB A process is described for the reduction of Fe ore in a specially constructed rotary furnace. The reducing gas is recycled and reheated in such a way to keep its composition and temperature constant, by enrichment with fresh gas in the same proportion as that which has been purged and burned. With Fe-containing anatase ore and CO/CO₂ ratio of <4 at 500-700°, Fe recovery was 79% (700°) to 84.5% (500°); with a CO/CO₂ ratio of >4, the Fe recovery was 81.9% (600°) to 83.6% (500°). The furnace has 125 kg/h capacity with the charge

process time of 2h; it is equipped with special rings which control gas admission and removal.

IC C22B005-12

CC 54-2 (Extractive Metallurgy)

ST iron ore redn furnace; anatase iron redn furnace

IT Furnaces

(rotary, for reduction of iron ores, reducing gas recycling in)

IT 7439-89-6P, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)
(preparation of, by reduction of ores in rotary furnace,
reducing gas recycling in)

IT 1317-70-0

RL: PROC (Process)

(reduction of iron-containing, in rotary furnace,
reducing gas recycling in)

L50 ANSWER 7 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN

AN 1980:96202 HCPLUS Full-text

DN 92:96202

OREF 92:15705a,15708a

TI Hydrochloric acid processing of a titanium-containing raw material

AU Pogorelov, V. I.; Baitenev, N. A.; Tegisova, A. T.; Kozhnazarova, M. D.; Antonyuk, V. I.

CS Inst. Metall. Obogashchem., Alma-Ata, USSR

SO Kompleksnoe Ispol'zovanie Mineral'nogo Syr'ya (1979), (8),
38-47

CODEN: KIMSDD; ISSN: 0202-1382

DT Journal

LA Russian

AB Synthetic rutile for the manufacture of pigment TiO₂ is obtained as an undissolved residue from the decomposition of Ti-containing concs. by HCl. The optimum concentration of HCl is 20-2%, leaching time 5-6 h, and solid-to-liquid ratio 1:4-1:7. The synthetic rutile contained TiO₂ 86.3-92.2 and Fe 2.4-2.5% and the recovery of TiO₂ was 96.8-98.5%. The TiO₂ purity can be increased to 95-6% by magnetic separation

CC 49-3 (Industrial Inorganic Chemicals)

ST titanium ore acid leaching; rutile prep

IT Titanium ores

RL: RCT (Reactant); RACT (Reactant or reagent)
(leaching of, by hydrochloric acid)

IT 1317-80-2P

RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of, by titanium ore acid leaching)

L50 ANSWER 8 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 1980:62427 HCAPLUS Full-text
DN 92:62427
OREF 92:10297a,10300a
TI Concentration of titanium-containing anatase ore
IN Paixao, Jose Marcio Jardim; Falcao de Mendonca, Paulo Ayres
PA Brazil
SO U.S., 4 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4176159	A	19791127	US 1978-917072	197806 19

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PRAI US 1976-741625 A2 19761115 <--
AB A Ti ore after mech. concentration contained anatase 81.64, total Fe 6.45, and P2O5 0.86%. The concentrate (-200 mesh) was roasted at 750° for 30 min in CO2. After cooling to 500°, the calcine was reduced for 45 min in N 60, CO2 24, and CO 16%. Magnetic separation at 600 G gave a magnetic fraction with TiO2 40.71 and Fe 23.66%, and a nonmagnetic fraction with TiO2 86.66 and Fe 4.48%. The nonmagnetic fraction was leached with HCl, filtered, washed, and treated with 5% NaOH. The final product contained TiO2 90, Fe 2.38, and P2O5 0.03%.
IC C01G023-00; C01G023-04
INCL 423080000
CC 54-1 (Extractive Metallurgy)
ST anatase ore purifn; titania concn purifn; iron removal anatase ore; phosphorus removal anatase ore
IT 13463-67-7P, preparation
RL: PREP (Preparation)
 (purification of anatase ore containing, removal of iron and phosphorus in)
IT 7439-89-6, uses and miscellaneous 7723-14-0, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
 (removal of, from titanium ore containing anatase)

L50 ANSWER 9 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 1979:58754 HCAPLUS Full-text

DN 90:58754
 OREF 90:9335a, 9338a
 TI Titanium dioxide ore concentration
 PA Mineracao Mascote Ltda., Brazil
 SO Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 53127398	A	19781107	JP 1978-25050	197803 07
	ZA 7801126	A	19790131	ZA 1978-1126	197802 27
NL	7802201	A	19780912	NL 1978-2201	197802 28
GB	1568333	A	19800529	GB 1978-8896	197803 07
FR	2383127	A1	19781006	FR 1978-6691	197803 08
FR	2383127	B1	19841228		
AU	7834034	A	19790913	AU 1978-34034	197803 09
PRAI	AU 515999	B2	19810514		
	BR 1977-1443	A	19770309	<--	

AB A low-grade concentrated TiO₂ ore is reduced at 500-1300°, extracted with a mineral acid and magnetically refined, then extracted with an alkaline solution to upgrade the TiO₂ ore. Thus, a low-grade anatase was reduced in H₂S and leached with HCl. The leached solid was magnetically separated. The nonmagnetic anatase was the upgraded TiO₂ ore, 96.8-97.5% TiO₂.

IC C01G023-04
 CC 54-2 (Extractive Metallurgy)

ST titanium dioxide concn anatase; anatase redn leaching;
magnetic sepn anatase concn
IT 1317-70-0P
RL: PREP (Preparation)
(concentration and purification of, magnetic sepn
. in)

L50 ANSWER 10 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 1978:445870 HCAPLUS Full-text
DN 89:45870
OREF 89:7145a, 7148a
TI Anatase concentrates with high titanium dioxide content
IN Novaes de Almeida, Nelson; Lakschevitz, Arthur, Jr.
PA Brazil
SO Braz. Pedido PI, 6 pp.
CODEN: BPXXDX
DT Patent
LA Portuguese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	BR 7604610	A	19771129	BR 1976-4610	197603 12

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PRAI BR 1976-4610 A 19760312 <--
AB Abundant anatase ores, low in TiO₂ and high in Fe₂O₃, are ground and reduced in horizontal rotary furnaces in reducing atmospheric of SO₂ + Co or H₂S at 600-1000°. The reduced FeS-containing ore is cooled with exclusion of air to prevent oxidation and extracted with hot 10-20% HCl or H₂SO₄. The residue on filtration is washed with water and subjected to magnetic separation to give rutile-like material containing >96% TiO₂ and <2% Fe₂O₃.
IC C01G023-04
CC 49-9 (Industrial Inorganic Chemicals)
ST anatase beneficiation; iron removal anatase ore

L50 ANSWER 11 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 1977:124788 HCAPLUS Full-text
DN 86:124788
OREF 86:19671a, 19674a
TI Titanium concentrates
IN Beraldo, Jose L.
PA Serrana S. A. de Mineracao, Brazil
SO S. African, 10 pp.
CODEN: SFXXAB

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	ZA 7500110	A	19760825	ZA 1975-110	197501 06
				<--	
	BR 7407564	D0	19741119	BR 1974-7564	197409 11
				<--	

PRAI BR 1974-7564 A 19740911 <--

AB Ti ore composed of anatase [1317-70-0], ilmenite [12168-52-4], and gangue minerals is ground to minus 100-mesh, deslimed, and, if necessary, subjected to a low-field magnetic separation to remove magnetite [1309-38-2] and other Fe minerals. The nonmagnetic fraction is ground in an acid (HCl or H₂SO₄) medium to remove adhering films of gangue, dewatered, neutralized with NaOH, Na₂CO₃, or NH₄OH, and floated with an amine agent in the presence of a silicate depressant (NaF, Na₂SiF₆, or Na silicate). The tailings are discarded and the Ti product is treated with a Ti depressant (gelatinized starch) and silicates are floated off. The noncollected fraction of Ti minerals may be separated electromagnetically to sep. anatase in the nonmagnetic fraction and ilmenite in the magnetic fraction.

IC C01B

CC 54-1 (Extractive Metallurgy)

ST titanium ore concn magnetic; ilmenite anatase
magnetite sepn; flotation titanium ore

IT Titanium ores

RL: PROC (Process)

(concentration of, by magnetic separation and flotation)

IT 1309-38-2 1317-70-0 12168-52-4

RL: PROC (Process)

(separation of, from titanium ores by
magnetic separation and flotation)

L50 ANSWER 12 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN

AN 1977:124667 HCPLUS Full-text

DN 86:124667

OREF 86:19659a,19662a

TI Reduction stripping of a titanium concentrate by natural gas

AU Meerson, G. A.; Kiparisov, S. S.; Yasinovskii, K. D.

CS Mosk. Inst. Stali Splavov, Moscow, USSR

SO Izvestiya Vysshikh Uchebnykh Zavedenii, Tsvetnaya Metallurgiya (1976), (6), 41-4
CODEN: IVUTAK; ISSN: 0021-3438
DT Journal
LA Russian
AB Reduction of a Ti-Fe concentrate (TiO₂ 63.75, Fe₂O₃ 26.40%) by natural gas or partly combusted natural gas to obtain Ti oxycarbonitride (for use as soluble anode in electrolytic Ti production) was studied in a single-zone elec. heated fluidized-bed reactor. Partially burnt natural gas gave better results than natural gas itself, since the TiN formed by the N₂ lowered the reduction temperature of the concentrate. A thin refractory C film formed on the surface of concentrate particles due to the residual CH₄ in the gas, and prevented their coalescence. The product obtained had ≤24.3% free C due to the graphite particles used in starting of the process, but this could be reduced to 7.1% by use of coarser graphite particles (+0.315 -0.67 mm). Use of fine concentrate (-0.25 mm), coarse graphite, and partially burnt natural gas gave the best results. The product composition was a solid solution (containing TiO 15.6, TiC 26, TiN 49, and Ti 9.4%) 63.6, Fe 20.6, free C 7.1%, and balance gangue. The Fe could be subsequently reduced to .apprx.2% by washing with 10% HCl.
CC 54-2 (Extractive Metallurgy)
ST titanium ore redn roasting; iron
titanium ore roasting; natural gas
titanium ore roasting
IT Natural gas
RL: PROC (Process)
(reduction roasting by, of titanium-iron concs.)

L50 ANSWER 13 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1976:109072 HCAPLUS Full-text

DN 84:109072

OREF 84:17747a,17750a

TI Titanium oxide concentrate from titanium ore containing iron

IN Fukushima, Seitaro

PA Mitsubishi Metal Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 50145309	A	19751121	JP 1974-53587	

197405
14

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PRAI JP 1974-53587 A 19740514 <--
AB Fe-containing Ti ore is calcined, chlorinated in the presence of a reducing agent, separated magnetically, and then by flotation. Thus, ore containing TiO₂ 53.4, FeO 20.4, and Fe₂O₃ 19.8% was calcined in a rotary kiln at maximum temperature 1050°, chlorinated with ore from magnetic separation and calcined petroleum coke 200 mesh as a fluidized bed at 950° with 200 l. Cl, separated in a 2.6 + 104 G magnetic field, and the nonmagnetic part was floated with K amylxanthate 200 and iso-PrMe-carbinol 100 g to obtain TiO₂ of 96.2% purity.
IC C22B; C01G
CC 54-2 (Extractive Metallurgy)
ST titanium ore chlorination magnetic sepn
IT 13463-67-7P, preparation
RL: PREP (Preparation)
(from titanium ores containing iron, by chlorination and magnetic separation)

L50 ANSWER 14 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 1975:501316 HCAPLUS Full-text
DN 83:101316
OREF 83:15891a,15894a
TI Two-stage smelting of titaniferous iron ore by solid-state kiln reduction followed by melting and slag separation
IN Ishihara, Shinzaburo
PA Ishihara Mining and Chemical Co., Ltd., Japan
SO Jpn. Tokkyo Koho, 2 pp.
CODEN: JAXXAD
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 50006164 B 19750311 JP 1970-63826 197007
20

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PRAI JP 1970-63826 19700720 <--
AB A Ti [7440-32-6]-containing Fe [7439-89-6] ore is mixed with a reducing agent, heated in a kiln in a reducing atmospheric, then fed into a smelting furnace for separation of the Fe component and the Ti. Thus, ilmenite containing 40-60 weight% Ti is pelletized (2 + 10 + 20 cm) with coke and heated in a tunnel kiln at 1200-1300° in a

reducing atmospheric made by combustion of heavy oil. The reduced intermediate product is then heated in a melting furnace at 1400-1500°. The Fe is melted, and the Ti-containing slag floats to the surface of the molten Fe and is separated

IC C22B; C21B
CC 54-2 (Extractive Metallurgy)
ST iron titanium ore smelting

L50 ANSWER 15 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 1975:101531 HCAPLUS Full-text
DN 82:101531
OREF 82:16201a,16204a
TI Beneficiation of titaniferous ores utilizing hot wall continuous plasma reactor
IN Skrivan, Joseph F.; Chase, John D.
PA American Cyanamid Co.
SO U.S., 5 pp.
CODEN: USXXAM
DT Patent
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3856918	A	19741224	US 1973-345606	197303 28

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PRAI US 1973-345606 19730328 <--
AB Low-grade Ti ore containing Fe, ground to 70-200 mesh, is beneficiated to a product containing over 90% TiO₂ by pouring down through an upright insulated refractory-lined reaction zone at least 3 times as long as its diameter. The ore particles are melted for 0.01-5 min by an arc plasma blown downward at .apprx.8000°F by a reducing gas such as CH₄ or H mixed with Ar. At a lower level, the particles are quenched by gas jets to break agglomerates into fine solid droplets of slag and metal resp., which are collected and freed from Fe by leaching with HCl or by magnetic separation. Suitable apparatus is described in detail and illustrated. The granular slag and metallic products were pulverized, the most highly magnetic Fe particles were removed, and others were leached 2 hr in 6N HCl, then analyzed spectrog. for Fe, and colorimetrically for Ti. The results were 90-93% TiO₂ and 5.4-8.75% Fe₂O₃, which were considered suitable for chlorination in preparation for TiO₂ pigment production

IC C01G
INCL 423069000
CC 54-2 (Extractive Metallurgy)

ST iron removal titanium ore; ore plasma titania
purifn

IT Plasma, chemical and physical effects
(iron removal by, from titanium oxide ores)

IT 7439-89-6, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from titanium ores, in
continuous arc plasma reactor)

L50 ANSWER 16 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 1975:51045 HCAPLUS Full-text
DN 82:51045
OREF 82:8069a,8072a
TI Phase analysis of titanium magnetite ores for
the titanium compounds
AU Koltasheva, R. N.; Fedorova, M. N.
CS Inst. "Uralmekhanobr", Sverdlovsk, USSR
SO Zavodskaya Laboratoriya (1974), 40(9), 1054-5
CODEN: ZVDLAU; ISSN: 0321-4265
DT Journal
LA Russian
AB Procedures for the phase anal. of titanomagnetite (I) ores were
developed. I was separated magnetically from 0.5-1 g sample (grain
size 0.074 mm), and Ti of I as well as Ti of ilmenite (II) and rock-
forming minerals was determined by the method of F. et al. (1961).
For determining I, the magnetic fraction was treated with 2.5N HCl on
a boiling water bath for 6 hr. The insol. residue was filtered,
washed 3-5 times with 2% HCl, and the filter with the residue was
added to the nonmagnetic fraction. In the solution, Ti from I was
determined. The nonmagnetic fraction, together with the residue from
the dissoln. of I, was calcined in a porcelain crucible at 500-600
and then at 800° for 30 min, cooled, and treated in a polyethylene
beaker with 50 ml 5N HNO₃, containing NH₄F 4 and K₂Cr₂O₇ 0.3%, on a
boiling water bath for 1.5 hr. The undissolved residue was separated
and washed 2-3 and 3-5 times with 1% HNO₃ and H₂O, resp. In the
residue, Ti of II and in the solution, Ti of silicate minerals were
determined
CC 79-6 (Inorganic Analytical Chemistry)
ST titanomagnetite ore phase analysis; titanium detn
titanomagnetite ore phase

L50 ANSWER 17 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN
AN 1966:445450 HCAPLUS Full-text
DN 65:45450
OREF 65:8431c-f
TI Removal of iron from ores containing iron and
titanium

IN Reeves, James W.
PA E. I. du Pont de Nemours & Co.
SO 6 pp.
DT Patent
LA Unavailable
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 1218734		19660608	DE	<--

PRAI US 19640429 <--
AB In a process for the removal of Fe from Ti ores, especially from ilmenite, the Fe contained in the ore is reduced in the solid state to the metal, the Fe obtained is oxidized to a soluble Fe(II) complex in the presence of an aqueous NH₃-(NH₄)₂CO₃ solution, the Fe(II) complex is then oxidized to hydrated Fe₂O₃ as sep. solid phase, the extracted ore is separated from the hydrated Fe₂O₃ and from the extracting liquid, and the TiO₂ concentrate formed is worked up in a known manner. Preferably, the ore is artificially weathered by burning it, e.g., at 600-1000° for 30-60 min. in an oxidizing atmospheric before reducing the Fe. The redn may be effected by passing the ore which has been heated to 800-1200° countercurrently to a stream of H at 800-1100° in 3-step fluidized-bed furnace which is kept at 800-1200° and at a pressure of 1-10 atm Alternatively, the reduction may be effected by charging a rotary furnace which is kept at 1100-1200° with a mixture containing Fe, Ti, and 10-50% coke, conducting the reduction until ≤75% of the Fe has been reduced, and finishing the reduction in a fluidized-bed furnace which is kept at 900-1100° by passing a reducing gas countercurrently through the ore mixture, said gas consisting of H, water gas, partially oxidized natural gas, or mixts. of these gases. In another embodiment, an elec. heated fluidized-bed furnace kept at 900-1300° is charged with an ore mixture containing 10-50% C, and the reduction is effected in the presence of a carrier gas consisting of H, water gas, partially oxidized natural gas, or mixts. of these gases which are passed in at such a rate and velocity that the fluidized bed in the furnace is maintained. The reduced metallic Fe is preferably oxidized by treating it at 20-80° and with a pressure of 0.14-3.85 atmospheric with an aqueous solution containing NH₃ 5-30 and CO₂ 3-25% by weight (NH₄)₂S may be added during oxidation in amts. of 0.05-0.20% by weight
IC C22B
CC 18 (Extractive Metallurgy)
IT 7440-32-6, Titanium
(from halides, by reduction with H in rotary furnace and fluidized bed)

IT 7439-89-6, Iron
(process metallurgy of, from ilmenite, reduction by H in rotary furnace and fluidized beds in)

L50 ANSWER 18 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN
AN 1965:57200 HCPLUS Full-text
DN 62:57200
OREF 62:10115a-b
TI Production of titanium concentrates from titanium ores of lower beneficiation ability
AU Madol'skii, A. P.; Slavnin, G. P.; Fedorov, B. T.; Kidyarov, B. I.
CS Polytech. Inst., Irkutsk
SO Tr. Irkutskogo Politekhn. Inst. (1963), No. 18, 156-9
DT Journal
LA Russian
AB Ti ore from eastern Siberia consisting of clay sands and siderite contains 0.5% ilmenite, 0.01% zircon, and 0.02% rutile. The ilmenite is concentrated in small particles (42% of the ilmenite is present in particles -0.01 mm.). By using gravity and magnetic separation, concentrates with 26% TiO₂ (ilmenite concentrate) and with 34.3% Fe (FeCO₃ concentrate) were prepared. Therefore, hydrometallurgical treatment of the ore was examined. After desliming, the gravity concentrate is prepared, which is further separated magnetically. The magnetic fraction is leached with HCl for the FeCO₃ decomposition. From the residue the Ti concentrate is prepared magnetically. This contains 50% TiO₂ with a recovery of 86.5%.
CC 18 (Extractive Metallurgy)
IT Titanium ores
(concentration of Fe-)

L50 ANSWER 19 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN
AN 1962:461458 HCPLUS Full-text
DN 57:61458
OREF 57:12169h-i,12170a-b
TI Metallurgical appraisal of ilmenite-titanomagnetite ores
AU Dmitrovskii, E. B.; Reznichenko, V. A.
SO Titan i Ego Splavy (1961), (No. 5), 28-33
CODEN: TSMBAQ; ISSN: 0495-6567
DT Journal
LA Unavailable
AB Selective magnetic concentration of 2 products and their sep. induction melting later was a method selected for utilizing these ores. The ore is magmatic solid solution containing TiO₂ 12.6 and FeO.Fe₂O₃ 58%. It was ball-milled to ≤2.5 μ (60 mesh). A 79.8% yield of titanomagnetite containing TiO₂ 13.5 and Fe 50.67% [concentrate (a)] was obtained in 2 steps of wet magnetic separation, at 1100 and 900 oe., resp. Nonmagnetic minerals were mech. separated

in order of d. Ilmenite was then subjected to concentration at \leq 4000 oe., and a 4.6% yield of dry magnetic ilmenite containing TiO₂ 38.95 and Fe 34.7% [concentrate (b)] was separated. Methods of TiO₂ extraction from (a) and (b) differ in details. A mixture of (a) and petr. coke, 4.0 and 0.445 % by weight, resp., in the stoichiometric ratio C:(a) 0.75, was induction-melted for \leq 60 min. at \leq 1200° and a yielded cast iron and (a) slag, 2.2 and 1.0 kg., resp. The (a) slag TiO₂ content, \leq 44.5%, became \leq 78% after HCl leaching and \leq 99% in the added H₂SO₄ solution. The (b) mixd. with petr. coke in 10% C excess was presintered for \leq 2 hrs. at \leq 1200° for reduction of Fe oxides to \leq 65%. The cake was then liquified by induction melting to sep. the metal and slag phases. The (b) slag contained TiO₂ 70%. Chlorination with extraction of TiCl₄ is one of the best methods of TiO₂ recovery, from slags, with a yield \geq 70%. The addnl. C in excess over the amts. used in exptl. tests causes recrystn. in slags and increases their m.ps. even after 20 min. melting. In the controlled C reduction of (a) and (b) the slags remained liquid. Their viscosity increased sharply with prolonged time of melting. Efficiency of this method is very high.

CC 19 (Extractive Metallurgy)
IT Iron ores
 Titanium ores
 (concentration of ilmenite-titanomagnetite)

L50 ANSWER 20 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN

AN 1961:53772 HCPLUS Full-text

DN 55:53772

OREF 55:10283e-h

TI Metallurgical-furnace charge material

IN Klugh, Bethune G.

PA Monsanto Chemical Co.

DT Patent

LA Unavailable

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	US 2961411		19601122	US 1954-448265	195408 06

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AB The high-temperature reduction of minerals in the presence of carbon results in the recovery of P, CaC₂, ferrosilicon, ferroaluminum silicon, Ca silicide, Ca Al silicide, silicon, fused Al₂O₃, SiC, ferrotitanium, ferrotungsten, ferroboron, ferrovanadium, ferromanganese, ferrosilicon, etc. An aqueous slurry of mineral

material and coal is prepared by wet-grinding as described in U.S. 2,754,067 (CA 50, 15141g) sufficiently fine to pass a 60-mesh screen. The slurry is kept agitated so that the solids will not settle out while being pumped into slurry feed and blending tanks. The slurry is then pumped into a rotary cylinder which is heated by hot combustion gases passing through it. The water is driven off as vapor and the slurry agglomerates into solids containing <15% by weight H₂O. The solids may be pressed into briquets or used as agglomerates. In either case, they are passed through a heating chamber at approx. 1000° in a reducing atmospheric to volatilize any volatile constituents. The solids are finally cooled in a reducing atmospheric and fed into a smelting furnace where reduction takes place.

CC 9 (Metallurgy)

IT Furnaces

(rotary, for flue dust, ores, slimes, etc.)

IT 12719-90-3, Titanium alloys, iron- 39396-89-9, Boron
alloys, iron-
(from ore slurries by agglomeration with coal and
reduction)

L50 ANSWER 21 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN

AN 1961:37546 HCPLUS Full-text

DN 55:37546

OREF 55:7256c-d

TI Pretreatment of iron sands or titanium-containing iron
ores

IN Sasagawa, Kiyoshi; Iyoda, Ryuzo; Ishimori, Zentaro

PA Tohoku Electro-Chemical Industry Co.

DT Patent

LA Unavailable

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 35002354 19600317 JP

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AB The Fe sands are heat-treated in a rotary kiln placed above a fluid-type reduction furnace, by means of a heavy-oil burner and a reducing gas from the reduction furnace. The pretreatment prevents the failure of gas venting in the reduction furnace during large-scale production.

CC 9 (Metallurgy)

IT 7440-32-6, Titanium

(metallurgy of, from iron-containing ores or sands by preliminary
heat-treatment in rotary kiln above fluidized-bed
furnace)

IT 7439-89-6, Iron
(metallurgy of, from titaniferous ores or sands by preliminary heat-treatment in rotary kiln above fluidized-bed furnace)

L50 ANSWER 22 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1959:11337 HCAPLUS Full-text

DN 53:11337

OREF 53:2059d-e

TI Recovery of iron, titanium, vanadium, and phosphorous from titanium-containing iron ores

IN Mukaiyama, Mikio

DT Patent

LA Unavailable

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 32008151 B4 19570925 JP

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AB Iron sand (100 g.) containing Fe 56.2, TiO₂ 11.08, MgO 2, SiO₂ 1.08, V₂O₅ 0.46, CaO 0.4, Al₂O₃ 0.36, and P 0.108% was melted in an elec. furnace with 25 g. Na₂CO₃ and 22 g. coke breeze to give pig iron containing C 3.9, Si 0.07, Ti 0.05, V 0.03, P 0.018%, rest Fe, and 28.3 g. slag containing TiO₂ 37.6, FeO 3.07, V₂O₅ 1.67, and P₂O₅ 0.33%. The slag was treated with water at 30° to extract P₂O₅, with a 5% H₂SO₄ solution to extract V₂O₅, and then with a 50% H₂SO₄ solution to recover TiO₂ as Ti(SO₄)₂. The amount of Na₂CO₃ (or NaOH) should be 1-1.8 times the total amount of TiO₂, V₂O₅, and P₂O₅ in the ore.

CC 9 (Metallurgy)

IT Hydrocarbon oils

(iron ore reduction by gases and, in elec.
furnace)

IT 7439-89-6, Iron

(metallurgy of, elec.-furnace process, by Fe sand reduction
with coke breeze-Na₂CO₃ mixture)

IT 7440-32-6P, Titanium

RL: PREP (Preparation)

(metallurgy of, from iron ore sands, by smelting in elec.
furnace and slag treatment with H₂SO₄)

IT 7440-62-2P, Vanadium

RL: PREP (Preparation)

(metallurgy of, from iron sand by smelting in elec.
furnace and slag treatment with H₂SO₄)

L50 ANSWER 23 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1958:97240 HCAPLUS Full-text

DN 52:97240
OREF 52:17064d-e
TI Acid treatment of fine ore to improve magnetic separation
IN Edwards, John O.
PA Maxworth Metal Products Ltd.
DT Patent
LA Unavailable
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	GB 795727		19580528	GB 1954-29434	195410 13

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AB Magnetic ores of W, Nb, Ta, Ti, Sn, and rare earths are finely ground, mixed with HCl, H₂SO₄, or HNO₃ and agitated. They are subsequently washed and dried to improve the magnetic separation of valuable minerals from gang. Thus, 500 lb. ore of unspecified composition (100-mesh) was treated in 1 hr. with 40 gal. concentrated H₂SO₄ and 30 gal. H₂O, the temperature rising to 120°.
CC 9 (Metallurgy and Metallography)
IT Niobium ores
Rare earth ores
Tin ores
Titanium ores
Tungsten ores
(magnetic separation of, acid treatment for)
IT Acids
(ore (magnetic) treatment with, for magnetic separation)
IT Tantalum ores
(separation (magnetic) of, acid treatment for)
IT Ores
(treatment of, concentration, classification, separation, etc., magnetic, acid treatment for)

L50 ANSWER 24 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN
AN 1956:77377 HCPLUS Full-text
DN 50:77377
OREF 50:14494e-g
TI Rendering titanium minerals and ores soluble in acids
IN Creitz, Ellis E.; Iverson, Henry G.
DT Patent
LA Unavailable

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2750255		19560612	US 1952-292596	195206 09

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AB Ti minerals, which are practically insol. in acids, are rendered soluble by roasting a finely ground mixture with Fe minerals and coke. The particle size should be -325 mesh. The mixture is sintered at 2100-500°F. for 10-30 min. in a nonoxidizing or slightly reducing atmospheric containing CO₂. The sinter is immediately quenched in water upon withdrawal from the furnace. Coke is added to maintain the Fe as Fe++. The ratio of TiO₂ to Fe in the product should be 1:1 to 4:1. If sufficient Fe is present, no addnl. Fe need be added.

CC 9 (Metallurgy and Metallography)

L50 ANSWER 25 OF 29 HCAPLUS COPYRIGHT 2008 ACS on STN

AN 1952:35633 HCAPLUS Full-text

DN 46:35633

OREF 46:6056h-i,6057a-b

TI Reducibility of ferrous minerals with high content of titanium oxide

AU Moraes, George Soares de

CS Parque aeronaut, Sao Paulo, Brazil

SO ABM (Bol. assoc. brasil. metais) (Sao Paulo) (1951), 7,
161-75

DT Journal

LA Unavailable

AB The material studied was an Fe ore originating from West New York, of the composition Fe 60, TiO₂ 13.6, V₂O₅ 1.25, SiO₂ 2.48%. The reduction was made with H by using a procedure based on works of Joseph (C.A. 35, 7900.5), Lewis, Specht, Philbroock (C.A. 37, 6611.2) and others, consisted of letting the hydrogen gas flow through the mineral in the elec.-combustion furnace and measuring the condensed water vapors in U-tubes. The factors studied were temperature, particle size of the ore, gas pressure, porosity of the mineral, intensity of flow of the H impurities in the mineral, and the reducing gas. The ultimate aim of the study is a possible application of the process in the blast furnace. The optimum particle size was found to be 30 mesh (diameter 0.5-0.6 mm.) at which the reduction speed was the highest. The lowest temperature at which the reduction starts was approx. 350°. The reaction velocity is then proportional to the increase of temperature. Contrary to observations of other research workers, the author found no interference with this rule by petrification (conglomeration), sintering, or formation of irreducible slag at higher temperature. Comparing with the results

obtained by other workers on minerals with different Ti-contents the author states that higher Ti-content appears to accelerate the speed of reduction at all particle sizes and all temps. Several diagrams and tables are presented.

CC 9 (Metallurgy and Metallography)
IT 7439-89-6, Iron
(metallurgy of, from titanium-containing ores)

L50 ANSWER 26 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN

AN 1948:19282 HCPLUS Full-text

DN 42:19282

OREF 42:4120a-b

TI Treatment of titanium-containing ores

IN Asak, Ragnvald

DT Patent

LA Unavailable

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 597146		19480120	GB 1939-7298	193903 06

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AB In ilmenite-containing Fe ores, where the Ti, V, and Cr contents are so finely divided that magnetic separation can not be effected, the Fe can be separated by reducing the ore in the dry state at 650-800° in a kiln using a reducing gas. An alkali compound is added to the ore previous to this step so that V and Cr compds. are transformed to soluble vanadates and chromates. The reduced ore is then lixiviated to get rid of the solubilized compds. after which the sponge iron is separated by magnetic means from the unaltered ilmenite.

CC 9 (Metallurgy and Metallography)

IT Titanium ores

(iron-, Fe recovery from)

L50 ANSWER 27 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN

AN 1946:3435 HCPLUS Full-text

DN 40:3435

OREF 40:541b-c

TI Reduction of ores, particularly iron ores

PA Norske Aktieselskab for Elektrokemisk Industri

DT Patent

LA Unavailable

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI NO 62230 19410630 NO
AB Ore, particularly iron ore, is lead through a furnace in counter direction to a current of gas containing CO, and a portion of the gas is withdrawn from the furnace and regenerated to CO in one or more carburetors. The remaining gas continues its passage through the ore and is burned to maintain the necessary reduction temperature. The ore is subjected in this manner to a partial reduction only, and complete reduction and smelting take place in a separate furnace by means of a solid reducing agent. The gas generated in the final reduction process is conducted through the carburetors and used in the initial stage as the reducing gas.
CC 9 (Metallurgy and Metallography)
IT Titanium ores
 (reduction of Fe-)
IT Metallurgy
 (reduction, and reduction and smelting in sep. furnaces
)
IT 7439-89-6P, Iron
RL: PREP (Preparation)
 (metallurgy of, oxide reduction, and reduction and smelting in sep. furnaces)

L50 ANSWER 28 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN
AN 1943:18206 HCPLUS Full-text
DN 37:18206
OREF 37:2965a-c
TI Flotation of nonmetallic minerals and various substances
AU Perruche, Lucien
SO Nature (Paris) (1941) 411-15
 From: Chem. Zentr. 1942, I, 2687.
 CODEN: NATRAJ; ISSN: 0369-3392
DT Journal
LA Unavailable
AB A survey of experiences and working methods in the flotation of metallic and nonmetallic minerals as well as the prospects and statistics. In addition to ores of Cu, Zn, Au, Pb, Fe, Mn, Ti, Be, Zr, etc., the flotation process is now used for coal, phosphates, chromates, fluorspar, limestone, S, baryta, kaolin, bituminous earths, talc, etc., as well as for the separation or precipitation of individual constituents of mixts., as KCl and NaCl from kainite and sylvinit, resp., C, Al and cryolite in Al smelting in the elec. furnace, NH₄Cl and alkali nitrates in fertilizer production, NaF, SiO₂ and Na₂CO₃ in the working up of fluorspar and NH₄Cl and NaHCO₃ in the production of soda by the Solvay process, and for the purification of sugar-cane juice, drinking water, etc.

CC 1 (Apparatus, Plant Equipment, and Unit Operations)
IT Alkali metal nitrates
Aluminum ores
Beryllium ores
Bituminous materials
Chromates
Coal
Copper ores
Gold ores
Iron ores
Kaolin
Lead ores
Limestone
Manganese ores
Phosphates
 Titanium ores
Zinc ores
Zirconium ores
 (flotation of)
IT 497-19-8P, Sodium carbonate 1304-28-5P, Barium oxide, BaO
7440-44-0P, Carbon 7447-40-7P, Potassium chloride
7631-86-9P, Silica 7647-14-5P, Sodium chloride
7681-49-4P, Sodium fluoride
7704-34-9P, Sulfur 12125-02-9P, Ammonium chloride 14542-23-5P,
Fluorite 14807-96-6P, Talc 15096-52-3P, Cryolite
RL: PREP (Preparation)
 (flotation of)

L50 ANSWER 29 OF 29 HCPLUS COPYRIGHT 2008 ACS on STN

AN 1923:6141 HCPLUS Full-text

DN 17:6141

OREF 17:1113e-g

TI Titanium chloride, oxide, and sulfate

IN Carteret, G.; Devaux, M.

DT Patent

LA Unavailable

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	GB 184948		19220831	GB 1921-17499	192106

27

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AB Ti ores containing Fe are reduced and chlorinated in such a manner that the Ti chloride is obtained sep. from the other products of the process. The ore is heated in a retort at 800° for 1 or 2 h. in the

presence of a slow current of reducing gas or by means of C. Dry Cl is passed through the furnace heated to 350°. At this temperature, the Fe only is attacked, and the FeCl₃, formed passes out and is collected. The direction of the Cl current is then reversed, and the temperature raised to 550-600°. The Ti is attacked, and the Ti chloride, contaminated with traces of Fe, Si, etc., passes out through another opening. The Ti chloride is purified by distillation, and may be used for the preparation of Ti sulfate and oxide. E. g., it may be dissolved gradually in dilute H₂SO₄, yielding the sulfate, or the solution so obtained may be diluted and boiled to yield the hydrated oxide. The HCl evolved in this last process is collected in an alkaline solution, which is then electrolyzed to regenerate Cl and alkaline solution for re-use. The H₂SO₄ resulting from the hydrolysis of the sulfate may be used to treat a further quantity of chloride, thus rendering the process cyclic. The Ti chloride may be dissolved in cold water, and the solution neutralized, e. g., with NaOH, to precipitate the oxide. The FeCl₃ may be heated to recover Cl for re-use, or it may be dissolved and reduced by means of iron sulfide, the S separated by filtration and the solution electrolyzed to recover a further quantity of Cl.

CC 18 (Acids, Alkalies, Salts, and Sundries)

IT 11130-18-0P, Titanium chloride

RL: PREP (Preparation)

(manufacture from ores)

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